



Worcester Public Schools Case Study

Overview

The Worcester Public Schools (WPS) system is made up of 50 schools, 60 buildings, teaches over 25,000 students and employees approximately 3,000 teachers and staff. WPS started developing an Environmental Management System in 2010 to reduce any environmental health and safety (EHS) risks to students and staff from facility operations and occupant activities, and achieve environmental compliance.

In 2017, WPS applied for a community grant from the Toxics Use Reduction Institute (TURI) to help meet the goals and mission of the EMS to reduce toxics in all departments. The grant covered School Nutrition (Food Service) and Transportation Departments. The grant included multiple goals.

School Nutrition (Food Service)	Environmentally Preferable Cleaning and Disinfection
	Integrated Pest Management
Special Education (SPED) Transportation	Environmentally Preferable Cleaning and Disinfection

In addition to the grant, WPS received testing assistance from the TURI Laboratory, and product selection information and training support from MD Stetson, a manufacturer and distributor of cleaning products located in Randolph, MA. MD Stetson is a TURI award recipient and is a vendor on the Massachusetts COMBUYS EPP cleaning product contract FAC85.

Over the course of the grant year (September 2017 through June 2018), the Worcester school system reduced the number of cleaning products in use by 70%, established protocols for safe product use and storage, conducted multiple training programs, developed green purchasing specifications, cleaned out hazardous waste, reorganized chemical storage, and piloted personal protective equipment and emergency wash stations. In addition, they developed and piloted an Integrated Pest Management Program for the School Nutrition Department.

School Nutrition (Food Service)

WPS operates different types of food service facilities, full service food preparation facilities and satellite receiving sites where the food prepared at the full-service facilities is warmed. The full-service kitchens require products and protocols for food preparation, cleanup and ware washing. Some, but not all, of the facilities have automatic dishwashers. All of the kitchens require both cleaning and sanitizing. The cleaning tasks are shared by the kitchen and custodial staff.

One ancillary, but essential goal was to establish standards and work practices to ensure continuity across the district using the same products and work and storage practices.

The project team implemented a systematic process:

- Developed a scope of work and project plan for all involved with the project, including assigning roles and responsibilities
- Developed specifications for Environmentally Preferable Product (EPP) purchasing contracts
- Identified EPP products
- Piloted a 7 kitchen program with new EPP cleaning products, dispensing systems and personal protective equipment (PPE)
- Established protocols for the cleaning process, including the use of PPE
- Obtained Safety Data Sheets for each product and aggregated them in an accessible space
- Cleaned out and disposed of old products
- Created new storage and dispensing systems
- Conducted cleaning training for all kitchen staff, 252 employees
- Implemented a Right to Know program
- Followed up with a focus group and survey to determine level of acceptance and to fine tune the program

The Food Service work also included development of an Integrated Pest Management (IPM) program, including an inspection checklist, pest control protocols, and training.

Transportation

The Transportation Department at WPS faced two challenges:

- 1) Greater potential for the transmission of infectious disease
- 2) Lack of standards and systems for selecting, using and storing cleaning and disinfecting products

Special Education (SPED) buses pose a unique risk for students, drivers and monitors. SPED students do not always have control over their bodily functions, and can transmit pathogens to one another, the drivers, or the monitors. They also have a higher rate of hepatitis than the general population. The buses are challenging to clean because some areas are inaccessible. Quick and effective cleaning and disinfecting is essential to reduce contact disease transmission.

The Transportation Department did not have a centralized purchasing process; different products were used for the same application. And, there were no standardized protocols for when and how cleaning and disinfecting tasks were conducted.

The interior architecture of a bus makes it difficult to clean and disinfect. There are many touch points: seats, seat belts, seat backs, etc. In addition, some of the locations impacted are inaccessible with a cloth such as the space between seats, the seat and the seat backs, etc.

With the help of TURI and MD Stetson, WPS tested NaDCC in diluted form, using an electrostatic sprayer. Personal exposure monitors worn by the bus staff while cleaning, indicated that the combination met safety standards. The use of the electrostatic sprayer significantly lessened the amount of time required for cleaning.

In addition, the staff used a hydrogen peroxide based cleaner for seat surfaces, walls, floors and windows. This product enabled them to minimize the number and types of products needed to clean all of the items.

Like the Food Service initiative, the Transportation initiative:

- Developed product specifications
- Identified EPP products
- Piloted a SPED bus program with new cleaning and disinfecting products and equipment, PPE and microfiber supplies
- Established protocols for the cleaning and disinfecting processes, including the use of personal protective equipment
- Obtained Safety Data Sheets for each product and aggregated them in an accessible space
- Cleaned out old products
- Created new storage and dispensing systems
- Conducted training on cleaning and disinfecting, Blood Borne Pathogens training for drivers and monitors who manage SPED buses
- Implemented a Right to Know program
- Followed up with a focus group and survey to determine level of acceptance and ways to fine tune the program

The WPS project team also developed protocols for emergency cleaning and disinfecting during transit.

In addition to the Food Service, Transportation and IPM work, the WPS team performed work for the Custodial Department:

- Drafted specifications for EPP products for the next contract purchasing cycle
- Substituted a safer alternative for disinfecting
- Conducted training for custodial staff on the new cleaner

Conclusions

The use of alternative products and the related training in how to use them reduced the risks of chemical health hazards, including asthma, chemical burns, and blindness. Creation of storage guidelines reduced product storage hazards. Use of EPPs will reduce future costs for hazardous waste disposal.

The project's focus group results and anecdotal feedback, documented that participating staff are very pleased with the changes. They recognize the value of the increased safety for themselves and the students. The standardized procedures will enable the district to more effectively monitor compliance, hold staff and administrators accountable, and minimize risk.

The IPM program will help reduce the risks from pest borne illnesses and other pest related impacts, such as allergies (mice were found in a recent study to be the number one allergen in an urban school system in the northeast that "was associated with increased asthma symptoms and decreased lung function"¹).

Moving Forward

The environmental management program will roll out to the remaining 14 full service and 33 satellite kitchens.

One open issue remains. The existing efficacy data for the use of NaDCC tablets in Food Service is insufficient for justifying its use. More research is being conducted to evaluate the benefits of switching from quaternary ammonium compounds to a NaDCC mixture.

¹ William J. Sheehan, MD^{1,2}; Perdita Permaul, MD^{2,3}; Carter R. Petty, MA⁴; et al Brent A. Coull, PhD⁵; Sachin N. Baxi, MD^{1,2}; Jonathan M. Gaffin, MD, MMsc^{2,6}; Peggy S. Lai, MD, MPH^{2,5,7}; Diane R. Gold, MD, MPH^{2,5,8}; Wanda Phipatanakul, MD, MS^{1,2}, *Association Between Allergen Exposure in Inner-City Schools and Asthma Morbidity Among Students*, JAMA Pediatr. 2017;171(1):31-38. doi:10.1001/jamapediatrics.2016.2543